REMARKS

Claims 1-24 are pending in this application. The present amendment amends claims 1-24 and adds new claims 25-36. Upon entry of this amendment, claims 1-36 will be pending. Applicant respectfully submits that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **February 8, 2006**.

Support for the amendments to the existing claims is discussed below in regard to the objections and rejections. Support for new claims 25-36 is as follows:

Support for new claim 25 may be generally found in the recitation of original claim 4 regarding the "sequence obtained by modifying a part of the sequence, the sequence encoding transglutaminase." The specific recitation regarding the hybridization characteristics of the modified sequence is supported by the specification on page 7, lines 5-18. Claims 26, 28, 29, 31, 32, 34, and 35, are analogously supported by original claims 5, 10, 11, 16, 17, 22 and 23, respectively.

Support for new claims 27, 30, 33 and 36 may be found in claims 6, 12, 18 and 24, respectively, and in the specification on page 9, lines 27-32, as discussed below.

Claims 7 and 19 are objected to for informalities. (Office action p. 2)

The objection is overcome by the amendments to claims 7 and 19. As suggested by the Examine, the article "a" is inserted before "transformant."

Claims 1-4, 6, 7-16, and 18-24 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point our and distinctly claim the subject matter which applicant regards as the invention. (Office action p. 2)

The rejection is overcome by the amendments to the claims. As suggested by the Examiner, the term "derived" is replaced by --isolated-- in claims 1-3, 7-9, 13-15 and 19-21. For clarity, Applicant has also deleted the recitations in claims 4, 5, 10, 11, 16, 17, 22, and 23, of "a sequence obtained by modifying a part of the sequence, the sequence encoding transglutaminase."

Applicant has rewritten dependent claims 4 and 16 as independent claims without the recitation of "derived from *Streptomyces mobaraensis*," since the structural gene is further defined in these claims.

Claims 6, 12, 18 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point our and distinctly claim the subject matter which applicant regards as the invention. (Office action p. 2)

The rejection is overcome by the amendments to the claims. The Examiner states that the recitation "mutant strain thereof" is unclear in scope. This phrase has been deleted in claims 6, 12, 18 and 24.

The "mutant strain" portions of the scopes of claims 6, 12, 18 and 24 form the basis of support for new claims 27, 30, 33 and 36, respectively. In these new claims, the recitation of "a mutant strain thereof" has been rewritten as a product-by-process recitation: "a strain obtained by mutating *Streptomyces mobaraensis* S-8112" (or *Streptomyces lividans* 3131). This product-by-

process recitation is supported by the specification on page 9, lines 27-32, which discuss "producing the mutant strain," and Applicant submits that the scope of this recitation is definite in view of the disclosure.

Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. (Office action p. 3)

Reconsideration of the rejection is respectfully requested in view of the amendments to the claims.

The Examiner states that the specification teaches the structure of only two representative species of such DNAs for transglutaminase used to produce the claimed transformants. Moreover, the Examiner states that "the specification fails to describe any other representative species by any identifying characteristics or properties other than the functionality of encoding any transglutaminase to be used to produce transformed wild type and mutant strains."

In the amendments to claims 1-3, 7-9, 13-15 and 19-21, "derived" has been amended to --isolated--, as discussed above. In these claims, as amended, therefore, the gene of transglutaminase reads only on the gene of transglutaminase isolated from specific strains, and there is no issue regarding mutant strains. New claims 27, 30, 33 and 36 are product-by-process claims, and Applicant submits that the scope of these claims is also clear in view of the disclosure in the

specification.

As noted above, Applicant has also deleted the recitations in claims 4, 5, 10, 11, 16, 17, 22, and 23, of "a sequence obtained by modifying a part of the sequence, the sequence encoding transglutaminase." In these claims, as amended, the sequences comprise either SEQ ID NO: 1 or SEQ ID NO: 2.

Applicant also submits that new claims 25-36 fully comply with the written disclosure requirement. In particular, new claims 25, 26, 28, 29, 31, 32, 34 and 35, recite transformants having structural genes comprising a sequence obtained by modifying SEQ ID NO: 1 (or SEQ ID NO: 2), with the scope of the modification being defined by the **specifically recited hybridization parameters**. Applicant submits that the scope of these claims is clearly defined.

Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a wild type S. mobaraensis or S. lividans strains comprising wild type transflutaminase gene of SEQ ID NO: 1 or a fragment of SEQ ID NO: 2 encoding a transglutaminase, cloning in an expression vector with promoter and terminator for expression of the polypeptide and collecting the produced transglutaminase, does not reasonable provide enablement for any transformant of S. mobaraensis or S. lividans strains comprising any wild type transglutaminase or mutant gene obtained by modifying a part of the sequence of SEQ ID NO: 1 or a fragment of SEQ ID NO: 2 derived from S. mobaraensis, cloning of the polypeptide (wild type or mutant) in the said bacterial strains and collecting the produced

transglutaminase. (Office action page 4)

Reconsideration of the rejection is respectfully requested in view of the amendments to the claims.

As discussed above for the written description rejection, the gene of transglutaminase in amended claims 1-3, 7-9, 13-15 and 19-21, reads only on the gene of transglutaminase isolated from specific strains, and one of skill in the art can obtain these genes. Similarly, new claims 27, 30, 33 and 36 are product-by-process claims, and one of skill in the art can mutate the recited strains.

Applicant also submits that new claims 25-36 are fully enabled by the specification. In particular, new claims 25, 26, 28, 29, 31, 32, 34 and 35, recite transformants having structural genes comprising a sequence obtained by modifying SEQ ID NO: 1 (or SEQ ID NO: 2), with the scope of the modification being defined by the specifically recited hybridization parameters. As the Examiner has noted, recombinant and mutagenesis techniques are well known to those of skill in the art, and the given hybridization parameters allow one of skill in the art to obtain sequences within the scope of the claim by standard techniques and **without experimentation**.

Applicant notes, in particular, the Examiner's remarks on page 5, middle paragraph, of the Office action, in which the Examiner states that it is:

> "not routine in the art to prepare a bacterial strain ... by introducing any wild type or mutant gene as the positions within a protein coding sequence of the genes where amino acid modifications can be made with a reasonable expectation of success ... and the result of such modifications is unpredictable ...."

This appears to be the Examiner's assumption about one possible method of obtaining the present

invention, although it is unclear exactly what this method would entail. Applicant submits, however, that preparing transformants of the present claims, as amended, would not require "introducing **any** wild type or mutant gene," and that, in fact, the transformants of the present invention can be obtained by standard techniques **without** experimentation, and with the expected outcome within the scope of the claims.

Claims 13-24 are rejected under 35 U.S.C. §102(e) as being anticipated by Taguchi et al. (WO 01/29187 A1, "Process for producing microorganism-orgin transglutaminase", Ajinomoto Co., Inc., see IDS). (Office action page 7)

The rejection of claims 13-24 is respectfully traversed and reconsideration of the rejection is requested. (Applicant refers to US Patent Publication 2002/0187525 as a translation of Taguchi et al. WO '187.)

The Examiner states that Taguchi et al. discloses a process for producing microorganism-origin (*Streptomyces mobaraensis*) transglutaminase in transformant and the sequence of a transglutaminase (SEQ ID NO: 3 of the reference) is 100% identical to SEQ ID NO: 1 of the instant application. The Examiner also states that Taguchi et al. discloses the cloning the cDNA in expression vector and producing transformant *S. lividans* comprising the expression vector containing the sequence of a transglutaminase gene to produce transglutaminase in high efficiency and that the reference discloses a mutated transglutaminase gene and transformed *S. lividans*. The Examiner refers to SEQ ID NO: 3 of WO '189, which is an 1809-bp sequence, with the coding

sequence running from 578-1798, that is, 1221-bp.

Taguchi et al. discloses using the transglutaminase gene of a Streptomyces bacterium to generate an expression construct in which the "pro-structural part" is "linked to the down stream of the native promoter for transglutaminase gene" (paragraph [0008]). *S. mobaraense* is indicated to be "particularly preferable" (paragraph [0013]).

In traversing the rejection, Applicant notes that present claim 13 requires the presence of an externally introduced transglutaminase gene, a promoter, and a **terminator**. (All of the present claims either explicitly recite a terminator or inherently have a terminator in the recited sequence.) The Examiner states: "Taguchi et al. also disclose that gene is derived from S. mobarensis with natural promoter **and terminator**" (emphasis added). Taguchi et al. does disclose a transglutaminase gene and a promoter. However, **the term "terminator" is not mentioned in Taguchi et al.**

Applicant therefore respectfully submits that the Examiner is incorrect, and that Taguchi et al., in fact, **does not disclose or inherently have a terminator**. Applicant notes in this regard that the present application describes a terminator on page 8, lines 23-30. Example 5 identifies the exemplary terminator as "about 500 bp of terminator region" (page 15, line 8), with reference to Figs. 4 and 5. This terminator region clearly is **not present** in SEQ ID NO: 3 of Taguchi et al. WO '187, and Applicant submits that Taguchi et al. does not have a terminator.

Since Taguchi et al. does not disclose or suggest the terminator of claims 13-24, these claims

are not anticipated by, nor obvious over, Taguchi et al.

Claims 1-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Taguchi et al. (Office action p. 8)

The rejection of claims 1-12 is traversed, and reconsideration of the rejection is respectfully requested.

First of all, all of the present claims require a terminator. However, as discussed above for the rejection of claims 13-24, there is **no disclosure of or suggestion for a terminator** in Taguchi et al.

Secondly, the Examiner acknowledges that Taguchi et al. does not disclose a transformant of *S. mobaraensis*. Applicant notes, in regard to the host system, that the Summary of the Invention and the Detailed Description of the Invention in paragraphs [0005] to [0017] of Taguchi et al. **do not appear to discuss specific bacteria** that can be the host of the transformation, with the host mentioned only generally in paragraphs [0006] and [0008]. Paragraph [0001] (Field of the Invention) implies that *S. lividans* is the host system used in the invention. *S. lividans* is also recited in claim 3 of the reference as the host. *S. lividans* is also mentioned in paragraph [0004] with regard to prior art. *S. lividans* is used in Examples 2-4 in paragraphs [0028], etc. Example 2 appears to involve a plasmid containing the transglutaminase gene of *S. cinnameoneum* IFO 12852. In Example 3, this is used to transform *S. lividans* TK24.

The Examiner then states:

> "A [skilled] artisan would have [been] motivated to express the gene of transglutaminase with natural promoter and terminator from S. mobaraensis to produce a recombinant strain of **same host** S. mobaraensis to produce transglutaminase **in increased level**..." (emphasis added)

The Examiner's stated motivation for this modification of the reference is therefore derived entirely from an assumption that using the same bacterium as the source of the gene and as the host would give "increased level" or "high efficiency" of expression. However, the Examiner has given **no basis in the general art for this assumption**. Note that MPEP 2143.01 states:

> "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, **suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art**." (emphasis added)

and MPEP 2142 provides:

> "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, and not based on applicant's disclosure."

Applicant therefore submits that the Examiner has not provided a proper basis for the proposed modification of Taguchi et al. to use transformants of *S. mobaraensis*.

Since Taguchi et al. does not disclose or suggest the terminator recited in the present claims, and since the Examiner has not provided a proper motivation to modify Taguchi et al. to use transformants of *S.mobaraensis*, claims 1-12 are not anticipated by and non-obvious over Taguchi

Applicant further submits that the above remarks support an argument that new claims 25-36 are not obvious over Taguchi et al.

In view of the aforementioned amendments and accompanying remarks, the claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP

Daniel A. Geselowitz, Ph.D.
Agent for Applicant
Reg. No. 42,573

DAG/xl
Atty. Docket No. **050148**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930

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